IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.(Original) A beam-shaping optical element having an entrance surface, an exit surface located opposite thereto and an optical axis, wherein the optical axis coincides with the Z-axis of a three-axis rectangular XYZ system of coordinates, and at least one of the entrance surface and the exit surface is represented by a mathematical equation comprising a term representing a non-rotationally symmetric aspherical profile and correction terms, each correction term being a function of either variable X or Y, at least one of the correction terms being a function of variable X and at least one of the correction terms being a function of variable Y.

2.(Currently Amended) ~~A~~ The beam-shaping optical element

according to claim 1, wherein the at least one correction term comprising a function of variable X alone comprises a power of X, multiplied by a correction factor and the at least one correction term comprising a function of variable Y alone comprises a power of Y, multiplied by a correction factor.

3. (Currently Amended) ~~A~~ The beam-shaping optical element according to claim 1, wherein the at least one of the entrance surface and the exit surface is represented by the mathematical equation

$$Z = \frac{c_x x^2 + c_y y^2}{1 + \sqrt{1 - (1 + k_x)(c_x^{\,2} x^2) - (1 + k_y)(c_y^{\,2} y^2)}} + \sum_{i=1}^{m} A_i x^{2i} + \sum_{i=1}^{m} B_i y^{2i}$$

in which c_x and c_y are the curvature of the surface in the direction of the X axis and Y axis, respectively, and k_x, k_y and the correction factor A_i and B_i are constants.

4. (Currently Amended) ~~A~~ The beam-shaping optical element according to claim 3, in which the values of c_x and c_y are substantially different.

5. (Currently Amended) ~~A~~ The beam-shaping optical element according to claim 3, in which Ai is non-zero for at least one value of i and B_j is non-zero for at least one value of j.

6. (Currently Amended) ~~A~~ The beam-shaping optical element according to claim 1, in which at least one of the entrance and exit surfaces has a shape for minimizing the wave front aberrations of a light beam from a radiation source having passed through the beam-shaping optical element.

7. (Currently Amended) ~~A~~ The beam-shaping optical element according to claim 1, wherein an elliptical cross-section of a beam supplied by a radiation source is converted into a substantially circular cross-section.

8. (Currently Amended) ~~A~~ The beam-shaping optical element according to claim 1, positioned between a semiconductor laser and an optical element for converting a beam from the semiconductor laser into a parallel, diverging or converging light beam.

9.(Currently Amended) ~~A~~ The beam-shaping optical element according to claim 1, wherein a distance from the emitting point of a semiconductor laser to the entrance surface of the element is smaller than a distance from the image of the emitting point formed by the beam-shaping optical element to the entrance surface and with the image located in the object space.

10.(Currently Amended) ~~A~~ The beam-shaping optical element according to claim 1, wherein the mathematical equation

$$(NA_{out}/2)\ (1/NA_{inx} + 1/NA_{iny}) < 1$$

is satisfied, where NA_{out} is a numerical aperture at the exit surface and NA_{inx} and NA_{iny} are numerical apertures at the entrance surface in the X-Z plane and Y-Z plane, respectively.

Claims 11-19 (Canceled)

20.(New) The beam-shaping optical element of claim 1, wherein

at least one of the correction terms is adjusted to a merit function to approach the desired value.

21.(New) The beam-shaping optical element of claim 20, wherein the merit function is for a wave front aberration.

22.(New) The beam-shaping optical element of claim 20, wherein a value of the merit function is based on a first vergence of a first beam at the entrance surface and a second vergence of a second beam at the exit surface.